

Appendix D

Nutrient Content of Organic By-Products

Proper soil and crop management is required to avoid contaminating surface or groundwater when using fertilizer materials. Plant nutrient requirements can be met by applying inorganic or organic fertilizers. Nutrient and carbon content information is also very useful when tailor blending products for specialty purposes.

Table D-1. Nutrient Content of Various Organic Materials*

Material	Percentage by Weight						
	N	P2O5	K2O	Ca	Mg	S	Cl
Apple pomace	2	—	0.2	—	—	—	—
Blood (dried)	12 - 15	3.0	—	0.3	—	—	0.6
Bone meal (raw)	3.5	22.0	—	22.0	0.6	0.2	0.2
Bone meal (steamed)	2.0	28.0	0.2	23.0	0.3	0.1	—
Brewers grains (wet)	0.9	0.5	—	—	—	—	—
Common crab waste	2.0	3.6	0.2	—	—	—	—
Compost (garden)			varies with feedstocks and processes				
Cotton waste from factory	1.3	0.4	0.4	—	—	—	—
Cottonseed meal	6 - 7	2.5	1.5	0.4	0.9	0.2	—
Cotton motes	2.0	0.5	3.0	4.0	0.7	0.6	—
Cowpea forage	0.4	0.1	0.4	—	—	—	—
Dog manure	2.0	10.0	0.3	—	—	—	—
Eggs	2.1	0.4	0.2	—	—	—	—
Egg shells	1.2	0.4	0.2	—	—	—	—
Feathers	15.0	—	—	—	—	—	—
Fermentation sludges	3.5	0.5	0.1	7.3	0.1	—	—
Fish scrap (dried)	9.5	6.0	—	6.1	0.3	0.2	1.5
Fly ash:							
coal	0.3	0.1	—	0.6	0.1	10.0	0.5
wood	9.8	—	0.7	—	—	—	—

APPENDIX D – NUTRIENT CONTENT OF ORGANIC BY-PRODUCTS

Table D-1. Nutrient Content of Various Organic Materials (continued)*

Material	Percentage by Weight						
	N	P2O5	K2O	Ca	Mg	S	Cl
Frittercake:							
enzyme production	—	—	2.2	2.0	0.5	0.3	—
citric acid production	—	—	5.2	—	—	—	—
Garbage tankage	2.5	1.5	1.0	3.2	0.3	0.4	1.3
Greensand	—	1 - 2	5.0	—	—	—	—
Hair	12 - 16	—	—	—	—	—	—
Legume	3.0	1.5	1.0	0.5	2.4	1.9	1.2
Grass	0.8	0.2	0.2	0.3	0.2	—	—
Oak leaves	0.8	0.4	0.2	—	—	—	—
Oyster shell siftings	0.4	10.4	0.1	—	—	—	—
Peanut hull meal	1.2	0.5	0.8	—	—	—	—
Peat/muck	2.7	—	—	0.7	0.3	1.0	0.1
Pine needles	0.5	0.1	—	—	—	—	—
DAF sludge	8.0	1.8	0.3	—	—	—	—
Potato tubers	0.4	0.2	0.5	—	—	—	—
Potato, leaves & stalks	—	0.6	0.2	0.4	—	—	—
Potato skins, raw ash	—	—	5.2	2.0	7.5	—	—
Sawdust	0.2	—	0.2	—	—	—	—
Sea marsh hay	1.1	0.2	0.8	—	—	—	—
Seaweed (dried)	0.7	0.8	5.0	—	—	—	—
Sewage sludge (municipal)	2.6	3.7	0.2	1.3	0.2	—	—
Shrimp waste	2.9	10.0	—	—	—	—	—
Soot from chimney	—	0.5 - 11	—	1.0	0.4	—	—
Soybean meal	7.0	1.2	1.5	0.4	0.3	0.2	—
Spent brewery yeast	—	7.0	0.4	0.3	0.04	0.03	—
Sweet potatoes	0.2	0.1	0.5	—	—	—	—
Tankage	7.0	1.5	3-10	—	—	—	—
Textile sludge	2.8	2.1	0.2	0.5	0.2	—	—
Wood ashes	0.0	2.0	6.0	20.0	1.0	—	—
Wood processing wastes	—	0.4	0.2	0.1	1.1	0.2	—
Tobacco stalks, leaves	3.7-4.0	0.5-0.6	4.5-6.0	—	—	—	—
Tobacco stems	2.5	0.9	7.0	—	—	—	—
Tomatoes, fruit, leaves	0.2-0.4	0.1	0.4	—	—	—	—

Note: Approximate values are given. Have materials analyzed for nutrient content before using.

* Adapted from J. P. Zublena, J. V. Baird, and J. P. Lilly, Extension Soil Science Specialists

North Carolina Cooperative Extension Service, Publication AG-439-18 June 1991.

(see <http://ces.soil.ncsu.edu/soilscience/publications/Soilfacts/AG-439-18/>)

APPENDIX D – NUTRIENT CONTENT OF ORGANIC BY-PRODUCTS

Table D-2 . Nutrient Content of Manures (lb/unit wet basis) *

Type	TKN	P2O5	K2O	Ca	Mg	S
DAIRY						
Fresh (lb/ton)	10	5	8	4	2	1
Paved surface scraped(lb/ton)	10	6	9	5	2	2
Liquid manure (lb/1,000 lb) ¹	23	14	21	10	5	3
Lagoon liquid (lb/acre-inch) ²	137	77	195	69	35	25
Anaerobic lagoon sludge (lb/acre-inch) ²	15	22	81	2	4	4
BEEF						
Fresh (lb/ton)	12	7	9	5	2	2
Paved surface scraped (lb/ton) ¹	14	9	13	5	3	2
Unpaved feedlot (lb/ton)	26	16	20	14	6	5
Lagoon liquid (lb/acre-inch) ²	83	77	129	24	19	—
Lagoon sludge (lb/1,000 lb) ¹	38	51	15	36	5	—
BROILER						
Fresh (lb/ton)	26	17	11	10	4	2
House litter (lb/ton)	72	78	46	41	8	15
Stockpiled litter (lb/ton)	36	80	34	54	8	12
DUCK						
Fresh (lb/ton)	28	23	17	—	—	—
House litter (lb/ton)	19	17	14	22	3	3
Stockpiled litter (lb/ton)	24	42	22	27	4	6
GOAT						
Fresh (lb/ton)	22	12	18	—	—	—
HORSE						
Fresh (lb/ton)	12	6	12	11	2	2
LAYERS						
Fresh (lb/ton)	26	22	11	41	4	4
Undercage paved (lb/ton)	28	31	20	43	6	7
Deep pit (lb/ton)	38	56	30	86	6	9
Liquid (lb/1,000 lb) ¹	62	59	37	35	7	8
Lagoon liquid (lb/acre-inch) ²	179	46	26	62	57	52
Lagoon sludge (lb/1,000 lb) ¹	26	92	13	71	7	12
RABBIT						
Fresh (lb/ton)	24	23	13	19	4	2
SHEEP						
Fresh (lb/ton)	21	10	20	14	4	3
Unpaved (lb/ton)	14	11	19	24	7	6

APPENDIX D – NUTRIENT CONTENT OF ORGANIC BY-PRODUCTS

Table E-2 . Nutrient Content of Manures (lb/unit wet basis -continued)*

Type	TKN	P2O5	K2O	Ca	Mg	S
SWINE						
Fresh (lb/ton)	12	9	9	8	2	2
Surface scraped (lb/ton)	13	12	9	12	2	2
Liquid manure (lb/1,000 lb) ¹	31	22	17	9	3	5
Lagoon liquid (lb/acre-inch) ²	136	53	133	25	8	10
Lagoon sludge (lb/1,000 lb) ¹	22	49	7	16	4	8
TURKEY						
Fresh (lb/ton)	27	25	12	27	2	—
House litter (lb/ton)	52	64	37	35	6	9
Stockpiled litter (lb/ton)	36	72	33	42	7	10

* J.P. Zublena, J.V. Baird, and J.P. Lilly, Extension Soil Science Specialists, N. Carolina Cooperative Extension Service, Publication AG-439-18, June 1991.

(see12/97. <http://ces.soil.ncsu.edu/soilscience/publications/Soilfacts/AG-439-18/>)

Notes: Approximate nutrient contents are given. Have materials analyzed for nutrient content before using. North Carolina mean waste analysis 1981 to 1990 supplied by J.C. Barker, NCSU Dept. Biological and Agricultural Engineering.

¹ Pounds per thousand pounds of manure liquid (slurry);

² Pounds per acre-inch. Estimated total lagoon liquid includes total liquid manure plus average annual lagoon surface rainfall surplus; does not account for seepage.